

1. (5 pts) Graph the linear equation $2x + 3y = 6$. Show x - and y -intercepts.

2. (5 pts) Graph the linear inequality $2x + 3y \leq 6$. Be sure and show the “good stuff” clearly.
Hint: Use your work from #1.

3. (5 pts) Graph the *intersection* of the following inequalities on the same set of coordinate axes. In other words, assume this is an AND situation, as in class. Hint: Use your work from #2.

$$2x + 3y \leq 6$$

$$x \geq -2$$

4. (5 pts) Use the slope and y-intercept to graph $f(x) = \frac{2}{3}x - 2$. (I don't need to see an x-intercept.)

5. (5 pts) Determine if the following relation is a function. If not, explain why not. In either case, determine its domain and range.

$$\{(1,-2), (-2,1), (3,6), (-2,2), (-1,-2)\}$$

6. (5 pts) Write the equation $2x + 3y = 6$ in function notation.

Graph the following linear equations:

7. (5 pts) $x = -3$

8. (5 pts) $y = 4$

9. (5 pts) Find the slope of the line through (1, - 3) and (5, 5).

10. (5 pts) Find an equation of the line through (1, - 3) and (5, 5). Give your final answer in **point-slope form**. Hint: Use your work from #10. (Shouldn't take much room!)

11. (5 pts) Re-write your answer to #10 in **slope-intercept form**.

12. (5 pts) Re-write your answer to #11 in **function notation**. (Shouldn't take much room!)

13. (5 pts) Re-write your answer to #12 in **standard form**.

14. Suppose that the yearly cost of tuition and fees at a public four-year college can be estimated by the linear function

$$f(x) = 280x + 3000$$

where x is the number of years after 2000 and $f(x)$ is the total cost (in U.S. dollars).

- a. (5 pts) What is the slope and *what does it mean* in the current situation?
- b. (5 pts) What is the y-intercept of this equation and *what does it mean*?
15. (5 pts) Find an equation of the line through (1, -3) that is parallel to $f(x) = \frac{2}{3}x - 2$. Give your answer in point-slope form. (Shouldn't take much room!)

16. (5 pts) Find an equation of the line through (1, -3) that is perpendicular to $f(x) = \frac{2}{3}x - 2$. Give your answer in point-slope form. (Shouldn't take much room!)

17. Suppose $f(x) = \begin{cases} -2x+1 & \text{if } x < 1 \\ x-1 & \text{if } x \geq 2 \end{cases}$.

a. (5 pts) Graph this piecewise-defined function.

b. (5 pts) State the domain of $f(x)$ in set-builder *and* interval notation.

c. (5 pts **BONUS**) State the range of $f(x)$ in set-builder *and* interval notation.

18. (5 pts) Sketch the graph of $g(x) = (x-1)^2$ by transforming the basic function $f(x) = x^2$. Two graphs, total. Key points: $(-1, 1)$, $(0,0)$, and $(1, 1)$.

19. (5 pts) Sketch the graph of $g(x) = -\sqrt{x+4} - 5$ by transforming the basic function $f(x) = \sqrt{x}$. Be sure to do your vertical reflection, first. Then your horizontal and vertical shifts. (4 graphs, total. Key points: $(0,0)$, $(1, 1)$, and $(4, 2)$)